

Remarks/Arguments:

Claims 1-17 are pending and stand rejected.

By this Amendment, claims 1-13 and 15 are amended and new claim 18 is added. No new matter is presented by the claim amendments and new claim. Support for the claim amendments can be found throughout the original specification and, for example, in the original specification at page 9, line 22 to page 12, line 15 and FIG. 14.

Claim Objections

In the Office Action, at page 2, claim 10 is objected to because of the use of the phrase "can be".

Applicant has amended claim 10 to overcome this objection.

Reconsideration is respectfully requested.

Rejection of Claims 1-17 under 35 U.S.C. §103(a)

In the Office Action, at item 3, claims 1-17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Schneider (U.S. Patent No.: 4,752,727) in view of Bossen et al. (U.S. Patent No.: 5,944,955, hereafter referred to as Bossen).

Reconsideration is respectfully requested.

Claim 1

Claim 1 is directed to method for determining parameters of a fluctuating stream of fluid in a pipe using at least three electrodes provided at a periphery of the stream in spaced relationship to each other in a direction of flow, and recites:

sequencing the supply of an AC signal to a first transmitting electrode located upstream of a receiving electrode and to a second transmitting electrode situated downstream thereof;

receiving signals at the receiving electrode that is located between the first and second transmitting electrodes in succession from the first and second transmitting electrodes in accordance with the sequencing of the supply of the AC signal;

analyzing the received signals from the first and second transmitting electrodes to detect a time-discrete cross correlation between received signals of the first and second transmitting electrodes.

That is, the supply of the AC voltage signal is sequenced to the first and second transmitting electrodes. The first transmitting electrode is located upstream of the receiving electrode and the second transmitting electrode is situated downstream of the receiving

electrode in the direction of flow (e.g., the transmitting electrodes are not located at the same cross-section). Moreover, the received signals of the first and second transmitting electrodes are analyzed to detect a time-discrete cross correlation between received signals of the first and second transmitting electrodes.

Schneider Reference

Schneider discloses a flow velocity sensor for dielectric materials based on capacitive, correlative principles. In Schneider the transmitting electrode is arranged opposed to the sensor electrodes (i.e., the transmitting and sensor electrodes are at the same pipe cross-section).

Contrary to the recitation in claim 1, in all of the embodiments of Schneider except the embodiment of FIG. 3, one single common transmitting electrode is fed by an electrical voltage source and is used to provide an electric field. As a result of the single common transmitting electrode of Schneider, it is not possible to sequence the supply of the AC signal to first and second transmitting electrodes. Moreover, Schneider is silent regarding any circuitry used for sequencing such a supply.

Schneider discloses with respect to FIG. 3 that two transmitter electrodes 16' and 16" are fed jointly by the voltage source 12. (See Schneider at col. 8, lines 41-42.) FIG. 3 illustrates the use of two capacitor sensors 10' and 10" with the capacitance measurement taken across the periphery (from one side of the pipe to the other side of the pipe across the same pipe cross-section). As a result of this configuration, there is no need to sequence the voltage source 12. This is because, transmitting electrodes 16' and 16" have separate pairs of sensor electrodes 18':20' and 18":20", respectively, and thus do not need sequencing. Moreover, Schneider is silent regarding any circuitry used for sequencing the voltage source 12 and any disclosure regarding such sequencing.

In operation, the Schneider device of FIG. 3 uses at least a pair of sensor electrodes 18' and 20' for transmitting electrode 16' and at least a pair of sensor electrodes 18" and 20" for transmitter electrode 16". The difference of the induced displacement currents from each pair of sensor electrodes 18':20' and 18":20" is determined by difference circuits 40' and 40", respectively. The output of the difference circuits 40' and 40" are supplied to the correlator 60 as the signals S_x and S_y to be correlated. Contrary to the recitation in claim 1, in Schneider the correlation is of two differential signal and, in particular, the received signals of the first transmitting electrode (corresponding to the signal from either sensor electrode 18' or 20') and the second transmitting electrode (corresponding to the signal from either sensor electrode 18" or 20") are not analyzed to detect a time-discrete cross correlation between received signals of

the first and second transmitting electrodes. Instead, in Schneider differential signals are analyzed.

Bossen Reference

Bossen discloses a sensor for a sheetmaking system exploiting capacitive techniques. In Bossen a plurality of underwire water weight UW³ sensors are used to measure conductivity or resistance, dielectric constant and proximity of a material to the sensor. (See Bossen at col. 2, lines 1-6.) Each cell is independently coupled to an input voltage (Vin) from signal generator 25 through an impedance element Zfixed and each provides an output voltage to voltage detector 26 on bus Vout. (See Bossen at col. 15, lines 47-50.) That is, signal generator 25 supplies a voltage Vin to each UW³ sensor and each sensor generates an output Vout to detector 26. Further, signal generator 25 does not sequence the supply of an AC signal because each UW³ sensor receives a continuous signal Vin. Moreover, Bossen is silent regarding any circuitry used for sequencing the voltage Vin and any disclosure regarding such sequencing or correlation of signals.

Thus, neither Schneider nor Bossen disclose or suggest "sequencing the supply of an AC signal to a first transmitting electrode ... and to a second transmitting electrode" and, furthermore, "analyzing ... to detect a time-discrete cross correlation between received signals of the first and second transmitting electrodes," as required by claim 1.

Accordingly, it is submitted that claim 1 patentably distinguishes over Schneider in view of Bossen for at least the above-mentioned reasons.

Claims 2-10

Claims 2-10, which include all of the limitations of claim 1, are submitted to patentably distinguish over Schneider in view of Bossen for at least the same reasons as claim 1.

Claim 11

Claim 11 is directed to a device for determining parameters of a fluctuating stream of fluid in a delivery pipe using at least three electrodes provided at a periphery of the stream in spaced relationship to each other in a direction of flow, and recites "a receiving and evaluation device having a receiving electrode circumferentially surrounding the periphery of the stream for detecting the received signals produced by dielectric currents, for carrying out a time-discrete cross correlation and for determining transit times of fluctuations detected by the receiving electrode from cross correlation values," (emphasis added).

It is clear from the disclosures and figures of both Schneider and Bossen that the receiving electrodes do not circumferentially surround the periphery of the stream. For example, as previously mentioned, Schneider uses a different configuration in which the

transmitter and receiver (e.g., capacitive element) is across the same cross-section of the pipe (i.e., one side of the cross-section of the pipe including a transmitting electrode and the other side of the same cross-section of the pipe including one or more sensor electrodes).

Moreover, in FIG. 4B of Bossen, UW³ sensors are disposed under the wet stock which is supported by supporting Web 13. The UW³ sensors of Bossen, which are illustrated only to be under the wet stock, however, do not circumferentially surround the wet stock (i.e., the object being sensed). Thus, neither Schneider nor Bossen disclose or suggest the recitation of "a receiving electrode circumferentially surrounding the periphery of the steam," as required by claim 1.

Accordingly, it is submitted that claim 11 patentably distinguishes over Schneider in view of Bossen for at least the above-mentioned reasons.

Claims 12-17

Claims 12-17, which include all of the limitations of claim 11, are submitted to patentably distinguish over Schneider in view of Bossen for at least the same reasons as claim 11.

New Claim 18

New claim 18, which includes all of the limitations of claim 11, is submitted to patentably distinguish over the cited art for at least the same reasons as claim 11.

New claim 18 includes a patentable distinction beyond that of claim 11, namely that: "the receiving electrode is one common continuous receiver ring covering a circumference of the delivery pipe."

Consideration and allowance is respectfully requested.

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Conclusion

In view of the claim amendments, new claim and remarks, Applicant submits the application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,


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